

ABSTRACT OF THE DISCLOSURE

Methods for determining a surface voltage of an insulating film are provided. One method includes depositing a charge on an upper surface of the insulating film and
5 measuring a current to the wafer during deposition. The method also includes determining the surface voltage of the insulating film from the current. In this manner, the surface voltage is not measured, but is determined from a measured current. Another embodiment may include measuring a second current to the wafer during a high current mode deposition of a charge on the film and determining a second surface voltage of the
10 film from the second current. This method may be repeated until a Q-V sweep is measured. An additional embodiment may include altering a control voltage during deposition of the charge such that a current to the wafer is substantially constant over time and determining charge vs. voltage data for the insulating film.